Commonwealth of Kentucky
Division for Air Quality

COMMENTS AND RESPONSE

ON THE PROPOSED PERMIT

Title V, Operating
Permit: V-07-036
AK Steel-Ashland Works-Coke Plant
Ashland, Kentucky 41105-0191
June 5, 2008
Babak Fakharpour, Reviewer

SOURCE ID:	21-019-00027
SOURCE A.I. #:	43192
ACTIVITY ID:	APE20040001

SOURCE DESCRIPTION:

AK Steel Coke plant is a by-product, coke production facility located at 400 East Winchester Avenue in Boyd County, Kentucky.
Coal is unloaded from railcars, transferred from storage, mixed, crushed, and charged to the coke ovens via belt conveyors and larry cars. The coke oven battery #3 is made up of a row of 76 individual ovens that are 4 meters high. Coke oven battery #4, has 70 ovens which are 5 meters tall. In the coking process, coal is cooked, driving off volatile compounds from the coal as gases, to form carbon-rich coke. The byproduct gases are recovered and then the clean coke oven gases are used as fuel for heating the coke ovens and boilers.
Coal is charged through the three charge holes on the top of each oven by a technique called "staged charging". When the conversion of coal to coke is complete, the oven is disconnected from the gas collecting main and the coke is pushed out of the "coke side" of the oven into a rail car. The rail car with the hot coke is moved to the quench area where the hot coke is flooded with water.
There are other secondary activities at the source that include storage tanks, and waste water treatment plant to treat the weak ammonia liquor generated from the coke by-product plant and recycle acid gas back to the sulfur recovery unit.
The facility is a Title V major source of particulate matter, sulfur dioxide, nitrogen oxides, volatile organic compounds, carbon monoxide, and HAP emissions. This source is located in an attainment area for all pollutants except for Ozone (8 hour) and $PM_{2.5}$.

U.S. EPA REVIEW AND COMMENTS:

Comments on the AK Coke proposed permit were received on March 26th from U.S.EPA. We have reviewed the comments and addressed them below:

Battery 3

1. Underfiring – There are no adequate monitoring, recordkeeping, or reporting requirements to assure compliance with 401 KAR 61:140(3)(4). Since a continuous opacity monitoring system (COMS) is already continuously operated in the underfiring combustion stack [and is being used to assure compliance with the applicable maximum achievable control technology (MACT) standard], it is recommended that the facility be required to report exceedances of the 20% opacity limit based on 6-minute average COMS data.

Response: The Division acknowledges the comments. The Division has made changes to the permit to include additional monitoring, recordkeeping and reporting. The Division has also added the following language in regards to opacity:

c. The permittee shall use the MACT-recorded hourly average COM opacity data as an indicator of equipment performance. Within thirty (30) minutes of an hourly average opacity value exceeding twenty (20) percent, the permittee shall initiate;
   (1) An evaluation of the accuracy of the COM data output, initiation of necessary repairs on the unit if it has experienced a malfunction, and recording of the results; or
   (2) A determination and recording of the opacity of the emissions exiting the combustion stack following the procedures and protocol in Reference Method 9 for three (3), 6-minute blocks.

d. If the results of Method 9 test indicates an exceedance of the twenty (20) percent opacity standard, implement and record corrective actions. If conditions will not allow the performance of Method 9, document the reasons for not performing the test as well as the corrective actions implemented based on the COM opacity data.

2. Pushing – It appears that there are incomplete citations of authority in sections 2.b. and d.; the appropriate citation in both sections should be *401 KAR 61:140(3)(5)(b)*. Nonetheless, there do not appear to be adequate monitoring, recordkeeping, or reporting requirements to assure compliance with 401 KAR 61:140(3)(5)(b). EPA recommends that the required monitoring and reporting be at the same frequency as the applicable MACT [40 CFR 63.7291(a)(3)] with the one caveat being that the 15-second readings would begin upon the removal of the coke oven doors rather than when the mass of coke begins to move out of each oven. The facility would then demonstrate compliance with the MACT using the smaller set of 15-second readings (i.e., that which begins with the movement of coke) and compliance with the state implementation plan (SIP) limit using the larger set of 15-second readings (i.e., that which begins with the removal of the doors).

Response: The Division acknowledges the comments. The Division has made changes to the permit to include additional monitoring, recordkeeping and reporting. The Division has addressed EPA's concerned with regard to compliance with 401 KAR 61:140 (3)(5)(b) by adding the requirement to conduct opacity monitoring during four consecutive pushes per battery each day. In accordance with the regulation the reading will began upon removal of the coke oven doors and conclude when the hot car has entered the quench tower.

3. Quenching – The monitoring requirement specified in section 4.a. is not sufficient enough to assure compliance with 401 KAR 61:140(3)(6)(a). EPA recommends the facility be subject to monitoring and reporting frequencies similar to that of applicable MACT requirements (40 CFR 63.7291). Furthermore, the specified method [Kentucky Method 150 (F-1)] is not appropriate to assure compliance with 401 KAR 61:140(3)(6)(a) because it derives an average rather than a maximum value of opacity. Therefore, EPA also recommends that the permit specify 40 CFR Part 60, Appendix A, Method 9 as the monitoring method and modified such that the observer shall continuously observe the plume and record the maximum opacity observed.

Response: The Division acknowledges the comments. The Division has made changes to the permit to include additional monitoring, recordkeeping and reporting. The Division has modified the permit to require opacity monitoring to occur for at least four consecutive quenches each day the unit is operating. The Division has deleted the Kentucky Method 150 (F-1) reference and revised the permit to include the instantaneous maximum reading reference pursuant to 401 KAR

61:140, Section 5(6). The Division however does not believe that Method 9 will be an appropriate reference method as this regulation defines the compliance test method.

Battery 4

1. Underfiring – 401 KAR 59:010 applies since Battery 4 was rebuilt in 1977; however, it appears that this applicable requirement (along with the appropriate testing, recordkeeping, and reporting requirements) has been omitted. With respect to 401 KAR 59:010(3)(1)(a), EPA recommends that the facility be required to report exceedances of the 20% opacity limit base on 6-minute average COMS data since COMS is already continuously operated in the underfiring combustion stack.

Response: The Division reviewed 401 KAR 59:010 and found that pursuant to 401 KAR 59:010, Section 2(2), the "Process Weight" is defined as, "The total weight of all materials introduced in to any affected facility which may cause any emissions of particulate matter, but does not include liquid and gaseous fuels charged, combustion air, or uncombined water".

Pursuant to the above definition, the Underfiring cannot be regulated, as the process material is a gaseous fuel. However, AK Coke has agreed to accept this regulation as applicable to the #4 Underfiring.

Additionally language identical to the battery #3 Underfiring with regard to opacity has been added to this emission unit. Further a reference Method 5 performance test has been added to verify the compliance with particulate BACT limits.

2. Pushing – There do not appear to be adequate monitoring, recordkeeping, or reporting requirements to assure compliance with 401 KAR 59:010(3)(1)(b). For instance, the SIP compliance method, pursuant to 401 KAR 59:010(3)(1)(b), is Kentucky Method 150; however, the permit does not specify this. EPA recommends that the required monitoring and reporting be at the same frequency as the applicable MACT [40 CFR 63.7291(a)(3)]. Furthermore, since the applicable SIP requirement does not specify the beginning and ending points of the 15-second readings, it is recommended that the readings be defined as the very beginning of the pushing process, upon isolation of each coke oven from the rest of the battery, to each quench completion.

Response: The Division acknowledges the comments. The Division has made changes to the permit to include additional monitoring, recordkeeping and reporting. The Division has added the Reference Method 9 for opacity observations pursuant to 401 KAR 59:010, since the emissions from pushing are not intermittent. The Division has also specified the frequency of monitoring to make the 401 KAR 59:010 monitoring frequency match the MACT frequency

3. Quenching – The monitoring frequency specified in section 4.a. is inadequate to assure continuous compliance with the opacity standard of 401 KAR 59:010 specified in section 2.c. EPA recommends that the facility be subject to a frequency similar to that of the applicable MACT standard.

Response: The Division acknowledges your comments. The Division has modified the Quenching requirements to require observation of fugitive quenching emissions for at least four consecutive quenches each day. Visible emissions shall be monitored using Kentucky Method 150 (F-1).

General Comments

Battery 4

1. Quenching – It appears that quenching tower emissions have been improperly classified as "stack" rather than "fugitive" emissions in section 2.c. EPA believes such emissions more appropriately fall under 401 KAR 59:010(3)(1)(b) rather than (a).

Response: The Division acknowledges your comment. The permit has been revised to include the correct citation.

PUBLIC AND AFFECTED STATE REVIEW:

Affected states (Ohio and West Virginia) were notified of the issuance of the draft permit on November 20, 2007 via e-mail. On December 3, 2007, the public notice on availability of the draft permit and supporting material for comments by persons affected by the plant was published in the *Ashland Independent* in Ashland, Kentucky. The public comment period expired 30 days from the date of publication. A public hearing was held on February 1, 2008 in Catlettsburg, Ky. No comments were received during the hearing.
Comments were received from AK Steel-Ashland Works on December 26, 2007. Minor changes were made to the permit as a result of the comments received; however, in no case were any emissions standards, or any monitoring, recordkeeping or reporting requirements relaxed. The following is a detailed explanation of changes made to the permit and supporting documents. The U.S. EPA has 45-days to comment on this proposed permit.

COMMENTS AND RESPONSE:

The following comments from the source were submitted to the Division in a letter dated December 21, 2007.

Permit Application Summary Form

Comment 1. For the emission summary presented at the beginning of the permit package, we are uncertain as to the basis of the values for the Actual Emissions and Potential Emissions presented. For some pollutants, the values do not appear to correspond directly to information we have provided to the agency. We are also uncertain as to why the presented Actual Emissions are equal to the Potential Emissions instead of presenting The Actual Emissions values as what we reported in the facility's KYEIS report. This presentation implies that our "actual emissions" are at our allowable emission rates (potential emissions) and that any increase in our actual production rates from current rates would put our emissions above allowable levels, which simply is not accurate.

Division's response: The Division adjusted the table to reflect this request, but added the 3rd column of emissions. During this process, the Division recognized few errors in calculations and the corrections were made by changing the maximum allowable thruput for battery #4 from 270 to 113 tons/hr (BACT limit) and changing the emission factors for #3 & #4 Battery Underfiring

(calculating the emissions using lbs/ton coal instead of lb/MMCFof coke oven gas burned).
EMISSIONS SUMMARY:

Pollutant	Actual [a] (tpy)	Permitted Potential[b] (tpy)	Uncontrolled Unlimited Potential (tpy)
PM	303	742	6029
PM_{10}	137	353	3265
NOx	1154	2767	2897
CO	500	1174	3425
VOC	282	1108	12236
SO_2	539	1201	5529
Ammonia	0.125	88	422
Benzene	0.0047	7.96	276
Toluene	0.00047	2.66	90
Xylene	0.00015	0.88	31
Hydrogen Cyanide	0.13	1.3	2.3
Coke Oven Emissions		22	688
Source wide HAPs	0.26	38	1091

a. Copied from January 16, 2008 KEIS
b. Based on 1996 application and PSD determination BACT Limits/W required Controls

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Comment 2. In the permit, the last compliance demonstration under the Emission Limitations for No. 4 Battery Quenching in the first line, it stipulates that the PM emissions=[coke throughput (tons/hr)] x [0.54 lb PM / ton of coke]. It should read PM emissions=[#4 Battery coal throughput(tons/hr)] x [0.54 lb PM / ton of coal charged] . PM emissions for quenching are based on coal charged not coke quenched. That's why the last sentence is accurate in saying that compliance with the coal charging limit demonstrates compliance with this limit. (page 35)

Division's response: The Division concurs with the comment and has revised the permit as suggested by the source.

Comment 3. For the coke boilers (Nos. 1, 2, and 3), the Compliance Demonstration Method for the Emission Limitations does NOT stipulate the use of the KYEIS SO_2 emission factor until the completion of the Sulfiban performance test, which will establish an SO_2 emission factor for use thereafter. This issue was negotiated and agreed upon with KDAQ personnel during our meeting in Frankfort on October 24, 2007. (Page 42)

Division's response: The Division agrees with the comment. The permit had been changed to add

the above language.

Comment 4. For the coke boiler No.5, the Compliance Demonstration Method for the Emission Limitations does NOT stipulate the use of the KYEIS SO_2 emission factor until the completion of the Sulfiban performance test, which will establish an SO_2 emission factor for use thereafter. This issue was negotiated and agreed upon with KDAQ personnel during our meeting in Frankfort on October 24, 2007. (Page 43)

Division's response: The Division has revised the permit as requested by the source.

Comment 5. Emission source No. 25, the Ammonia Concentrator (AC) Still, no longer exists and should be taken out. (Page 46)

Division's response: The Division has revised the permit as requested by the source.

Comment 6. We identified some appropriate revisions to the Insignificant Activities List during our review of the permit. The attached list incorporates our revisions and should be added to the final permit. In addition, 401 KAR 50:035, Section 5(4) is listed as the applicable requirement. The KDAQ's regulations website does not include this citation. We believe that 401 KAR 52:020, Section 6(1) is the applicable requirement. (Page 65)

Division's response: The Division has revised the permit as requested by the source.

CREDIBLE EVIDENCE:

This permit contains provisions which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has only adopted the provisions of 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12 into its air quality regulations.